Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-17 (canceled)

18. (original): In a wireless communication system, a method for performing an extended algorithm (EA) with over-sampling, the method comprising:

(a) the system receiving a signal $\underline{r}^{(1)}$ at a first input and a channel impulse response $\underline{h}^{(1)}$ at a second input;

(b) zero padding the received signal $\underline{r}^{(1)}$ in the tail until the length of sequence achieves length Lm and denoting the extended sequence after zero padding as $\underline{r}_E^{(1)}$;

(c) zero padding the channel impulse response $\underline{h}^{(1)}$ in the tail until the length of the extended sequence achieves length Lm and denoting the extended sequence after zero padding as $\underline{u}_1$;

(d) performing a discrete Fourier Transform (DFT) or fast Fourier transform (FFT) on $\underline{r}_E^{(1)}$ such that $F(\underline{r}_E^{(1)})$;

(e) performing DFT or FFT on $\underline{u}_1$ such that $F(\underline{u}_1)$;

(f) conjugating $F(\underline{u}_1)$ such that $F(\underline{u}_1)^*$;

(g) multiplying the sequences $F(\underline{r}_E^{(1)})$ and $F(\underline{u}_1)^*$ such that $F(\underline{r}_E^{(1)}) \cdot F(\underline{u}_1)^*$, wherein for M sampled sequences, steps (b) - (g) are repeated for sampled sequences 2,...,M such that $F(\underline{r}_E^{(m)}) \cdot F(\underline{u}_m)^*$, m = 2,..., M.

19. (original): The method of claim 18, wherein all of the M sampled sequence results obtained in steps (b) – (g) are added element-to-element such that $\sum_{m=1}^{M} F(\underline{r}_E^{(m)}) \cdot F(\underline{u}_m)^*$, M = 1,2,...,M.

20. (original): The method of claim 19 further comprising:

(h) generating a channel correlation vector $\underline{g}$ using extended channel response sequences $\underline{u}_1,\ldots,\underline{u}_M$ such that $\underline{g} = \sum_{m=1}^{M} \underline{g}^{(m)}$;

(i) performing DFT or FFT on channel correlation vector $\underline{g}$ such that $F(\underline{g})$;

(j) dividing element-by-element the result in step (g) by the result in step (i) such that $\frac{\sum_{m=1}^{M} F(\underline{r}_E^{(m)}) \cdot F(\underline{u}_m)^*}{F(\underline{g})}$;

(k) performing an inverse DFT or inverse FFT on the result of step (j) such that $F^{-1}(\frac{\sum_{m=1}^{M} F(\underline{r}_E^{(m)}) \cdot F(\underline{u}_m)^*}{F(\underline{g})})$; and

(l) despreading the result of step (k) to obtain the estimated data symbols $\hat{\underline{d}}$.

21. (original): A wireless communication system for performing an extended algorithm (EA) with over-sampling, the system comprising:

(a) means for receiving a signal $\underline{r}^{(1)}$ at a first input and a channel impulse response $\underline{h}^{(1)}$ at a second input;

(b) means for zero padding the received signal $\underline{r}^{(1)}$ in the tail until the length of sequence achieves length Lm and denoting the extended sequence after zero padding as $\underline{r}_E^{(1)}$;

(c) means for zero padding the channel impulse response $\underline{h}^{(1)}$ in the tail until the length of the extended sequence achieves length Lm and denoting the extended sequence after zero padding as $\underline{u}_1$;

(d) means for performing a discrete Fourier Transform (DFT) or fast Fourier transform (FFT) on $\underline{r}_E^{(1)}$ such that $F(\underline{r}_E^{(1)})$;

(e) means for performing DFT or FFT on $\underline{u}_1$ such that $F(\underline{u}_1)$;

(f) means for conjugating $F(\underline{u}_1)$ such that $F(\underline{u}_1)^*$;

(g) means for multiplying the sequences $F(\underline{r}_E^{(1)})$ and $F(\underline{u}_1)^*$ such that $F(\underline{r}_E^{(1)}) \cdot F(\underline{u}_1)^*$, wherein for M sampled sequences, steps (b) - (g) are repeated for sampled sequences 2,...,M such that $F(\underline{r}_E^{(m)}) \cdot F(\underline{u}_m)^*$, m = 2,..., M.

22. (original): The system of claim 21, wherein all of the M sampled sequence results are added element-to-element such that $\sum_{m=1}^{M} F(\underline{r}_E^{(m)}) \cdot F(\underline{u}_m)^*$, M = 1,2,...,M.

23. (original): The system of claim 22 further comprising:

(h) means for generating a channel correlation vector $\underline{g}$ using extended channel response sequences $\underline{u}_1,\ldots,\underline{u}_M$ such that $\underline{g} = \sum_{m=1}^{M} \underline{g}^{(m)}$;

(i) means for performing DFT or FFT on channel correlation vector $\underline{g}$ such that $F(\underline{g})$;

(j) means for dividing element-by-element the result in step (g) by the result in step (i) such that $\frac{\sum_{m=1}^{M} F(\underline{r}_E^{(m)}) \cdot F(\underline{u}_m)^*}{F(\underline{g})}$;

(k) means for performing an inverse DFT or inverse FFT on the result of step (j) such that $F^{-1}(\frac{\sum_{m=1}^{M} F(\underline{r}_E^{(m)}) \cdot F(\underline{u}_m)^*}{F(\underline{g})})$; and

(l) means for despreading the result of step (k) to obtain the estimated data symbols $\hat{\underline{d}}$.

24. (new): A method of recovering data comprising:

computing a first column of a circulant matrix based on estimated channel response and noise power;

decomposing a received vector circulant matrix in a fast Fourier transform (FFT) domain;

decomposing a channel response circulant matrix in the fast FFT domain;

reconstructing a received signal vector resulting in an extended signal vector;

computing a composite spread signal vector; and

despreading the composite spread signal vector.

25. (new): Apparatus for recovering data, the apparatus comprising:

means for computing a first column of a circulant matrix based on estimated channel response and noise power;

means for decomposing a received vector circulant matrix in a fast Fourier transform (FFT) domain;

means for decomposing a channel response circulant matrix in the fast FFT domain;

means for reconstructing a received signal vector resulting in an extended signal vector;

means for computing a composite spread signal vector; and

means for despreading the composite spread signal vector.

26. (new): The apparatus of claim 25 wherein the apparatus is a wireless communication system.

27. (new): The apparatus of claim 25 wherein the apparatus is a wireless transmit/receive unit (WTRU).

28. (new): The apparatus of claim 25 wherein the apparatus is a base station.

29. (new): The apparatus of claim 25 wherein the apparatus is a receiver.